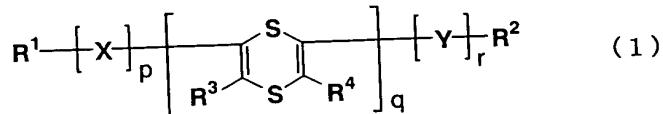


CLAIMS:

[1] A charge transport organic material comprising a compound of the general formula(1) having a 1,4-dithiin ring

5 [Chemical Formula 1]



(wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> independently represent hydrogen, a hydroxyl group, a halogen group, an amino group, a silanol group, a thiol group, a carboxyl group, a sulfonic acid group, 10 a phosphoric acid group, a phosphoester group, an ester group, a thioester group, an amido group, a nitro group, a monovalent hydrocarbon group, an organooxy group, an organoamino group, an organosilyl group, an organothio group, an acyl group or a sulfone group, X and Y independently represent at least one member of substituted or unsubstituted, 15 divalent conjugated units selected from aniline, thiophene, furan, pyrrole, ethynylene, vinylene, phenylene, naphthalene, anthracene, imidazole, oxazole, oxadiazole, quinoline, quinoxaline, pyridine, pyrimidine, pyrazine, phenylenevinylene, fluorene, carbazole, triarylamines, metal or metal-free phthalocyanine, and metal or metal-free porphyrin, two sulfur atoms contained in the dithiin ring may 20 independently be in the form of an SO group or an SO<sub>2</sub> group, and p, q and r independently represent 0 or an integer of 1 and over provided that p + q + r ≤ 20 is satisfied).

25 or

[2] The charge transport organic material according to claim 1, further comprising an electron accepting dopant substance or a hole accepting dopant substance.

30

[3] The charge transport organic material according to claim 1 or 2, wherein p, q and r in the general formula (1) satisfies that 3 ≤ p + q + r ≤ 10.

[4] A charge transport varnish comprising a charge transport organic material of any one of claims 1 to 3 and a solvent.

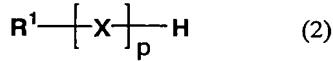
5 [5] A charge transport thin film prepared by use of the charge transport varnish defined in claim 4.

10 [6] An organic electroluminescent element comprising the charge transport thin film defined in claim 5.

[7] A method for preparing a compound having a 4-dithiin ring and represented by the formula (1) indicated hereinbelow, characterized by comprising:

15 the first step of reacting, in the presence of an acid catalyst, a compound of the formula (2)

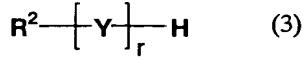
[Chemical formula 2]



(wherein R<sup>1</sup> hydrogen, a hydroxyl group, a halogen group, an amino group, a silanol group, a thiol group, a carboxyl group,

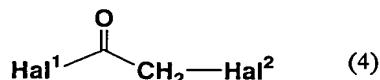
20 a sulfonic acid group, a phosphoric acid group, a phosphoester group, an ester group, a thioester group, an amido group, a nitro group, a monovalent hydrocarbon group or an organooxy group, X represents at least one member of substituted or unsubstituted, divalent conjugated units selected from aniline, thiophene, furan, pyrrole, ethynylene, vinylene, phenylene, naphthalene, anthracene, imidazole, oxazole, oxadiazole, quinoline, quinoxaline, pyridine, pyrimidine, pyrazine, phenylenevinylene, fluorene, carbazole, triarylamines, metal or metal-free phthalocyanine, and metal 30 or metal-free porphyrin, and p is an 0 or an integer of 1 or over), or a compound of the formula (3)

[Chemical Formula 3]



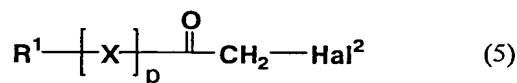
(wherein R<sup>2</sup> hydrogen, a hydroxyl group, a halogen group, an amino group, a silanol group, a thiol group, a carboxyl group, a sulfonic acid group, a phosphoric acid group, a phosphoester group, an ester group, a thioester group, an amido group, a nitro group, a monovalent hydrocarbon group or an organooxy group, Y represents at least one member of substituted or unsubstituted, divalent conjugated units selected from aniline, thiophene, furan, pyrrole, ethynylene, vinylene, phenylene, naphthalene, anthracene, imidazole, 10 oxazole, oxadiazole, quinoline, quinoxaline, pyridine, pyrimidine, pyrazine, phenylenevinylene, fluorene, carbazole, triarylamines, metal or metal-free phthalocyanine, and metal or metal-free polyphyrin, and r is an 0 or an integer of 1 or over), and an acid halide represented by the formula (4)

15 [Chemical Formula 4]



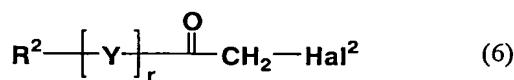
(wherein Hal represents a halogen atom), thereby preparing an acyl compound represented by the formula (5)

[Chemical Formula 5]



20 (wherein R<sup>1</sup>, X, p and Hal, respectively, have the same meanings as defined above), or the formula (6)

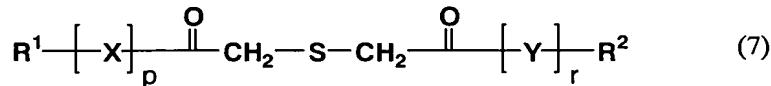
[Chemical Formula 6]



25 (wherein R<sup>2</sup>, Y, r and Hal, respectively, have the same meanings as defined above);

the second step of subsequently reacting the acyl compound represented by the formula (5), the acyl compound represented by the formula (6) and an alkali metal sulfide to 30 prepare a sulfide represented by the formula (7)

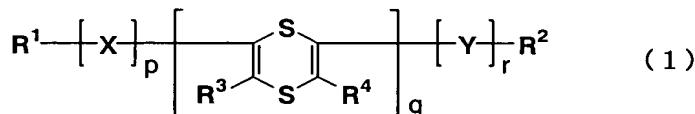
[Chemical Formula 7]



(wherein  $\text{R}^1$ ,  $\text{R}^2$ ,  $X$ ,  $Y$ ,  $p$  and  $r$ , respectively, have the same meanings as defined above); and

5 the third step of acting a thiocarbonyl reagent on the sulfide represented by the formula (7) for ring-closure, thereby preparing the compound of the formula (1) having a 1,4-dithiin ring

[Chemical Formula 8]



10

(wherein  $\text{R}^1$ ,  $\text{R}^2$ ,  $X$ ,  $Y$ ,  $p$  and  $r$ , respectively, have the same meanings as defined above,  $\text{R}^3$  and  $\text{R}^4$  independently represent hydrogen, a hydroxyl group, a halogen group, an amino group, a silanol group, a thiol group, a carboxyl group, a sulfonic acid group, a phosphoric acid group, a phosphoester group, an ester group, a thioester group, an amido group, a nitro group, a monovalent hydrocarbon group, an organooxy group, an organoamino group, an organosilyl group, an organothio group, an acyl group or a sulfone group, two sulfur atoms contained in the dithiin ring may independently be in the form of an  $\text{SO}$  group or an  $\text{SO}_2$  group, and  $q$  is 0 or an integer of 1 or over provided that  $p + q + r \leq 20$  is satisfied.

15

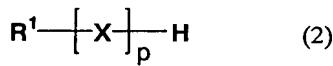
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[8] A method for preparing an acyl compound of the formula (5) or (6) indicated hereinbelow, characterized by comprising:

reacting, in the presence of an acid catalyst, a compound of the formula (2)

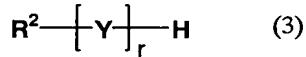
[Chemical Formula 9]



30

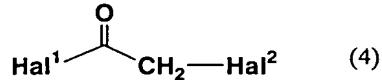
(wherein R<sup>1</sup> represents hydrogen, a hydroxyl group, a halogen group, an amino group, a silanol group, a thiol group, a carboxyl group, a sulfonic acid group, a phosphoric acid group, a phosphoester group, an ester group, a thioester group, an amido group, a nitro group, a monovalent hydrocarbon group or an organooxy group, X represents at least one member of substituted or unsubstituted, divalent conjugated units selected from aniline, thiophene, furan, pyrrole, ethynylene, vinylene, phenylene, naphthalene, anthracene, imidazole, oxazole, oxadiazole, quinoline, quinoxaline, pyridine, pyrimidine, pyrazine, phenylenevinylene, fluorene, carbazole, triarylamine, metal or metal-free phthalocyanine, and metal or metal-free porphyrin, and p is 0 or an integer of 1 or over) or the formula (3)

[Chemical Formula 10]



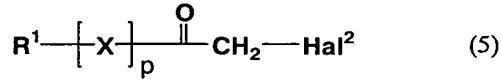
(wherein R<sup>2</sup> represents hydrogen, a hydroxyl group, a halogen group, an amino group, a silanol group, a thiol group, a carboxyl group, a sulfonic acid group, a phosphoric acid group, a phosphoester group, an ester group, a thioester group, an amido group, a nitro group, a monovalent hydrocarbon group or an organooxy group, Y represents at least one member of substituted or unsubstituted, divalent conjugated units selected from aniline, thiophene, furan, pyrrole, ethynylene, vinylene, phenylene, naphthalene, anthracene, imidazole, oxazole, oxadiazole, quinoline, quinoxaline, pyridine, pyrimidine, pyrazine, phenylenevinylene, fluorene, carbazole, triarylamine, metal or metal-free phthalocyanine, and metal or metal-free porphyrin, and r is 0 or an integer of 1 or over), and an acid halide of the formula (4)

[Chemical Formula 11]



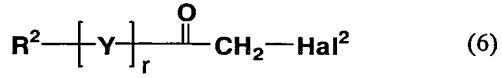
(wherein Hal represents a halogen atom), thereby preparing the acyl compound of either the formula (5)

5 [Chemical Formula 12]



(wherein R<sup>1</sup>, X, p and Hal, respectively, have the same meanings as defined above), or the formula (6)

[Chemical Formula 13]



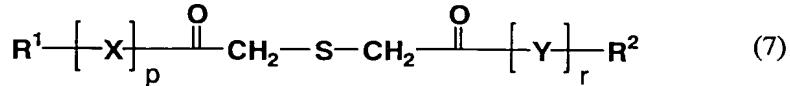
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(wherein R<sup>2</sup>, X, r and Hal, respectively, have the same meanings as defined above).

[9] The method for preparing an acyl compound according to  
15 claim 8, wherein said acid catalyst is made of ethyl aluminium dichloride or diethyl aluminium chloride.

[10] A method for preparing a sulfide represented by the  
20 formula (7) indicated hereinbelow, characterized by reacting  
the acyl compound represented by the formula (5), the acyl  
compound represented by the formula (6), both obtained in  
claim 8 or 9, and an alkali metal sulfide

[Chemical Formula 14]

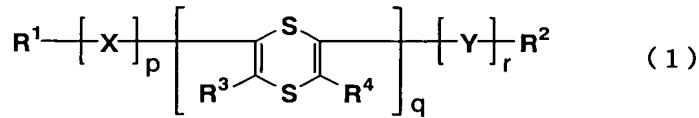


25 (wherein R<sup>1</sup>, R<sup>2</sup>, X, Y, p and r, respectively, have the same meanings as defined above).

[11] A method for preparing a compound having a 1,4-dithiin ring and represented by the formula (1) indicated hereinbelow, characterized by reacting a thiocarbonylizing reagent on the sulfide obtained in [10]

5 and represented by the formula (7)

[Chemical Formula 15]



(wherein  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{X}$ ,  $\text{Y}$ ,  $p$  and  $r$ , respectively, have the same meanings as defined above, and  $\text{R}^3$  and  $\text{R}^4$  independently

10 represent hydrogen, a hydroxyl group, a halogen group, an amino group, a silanol group, a thiol group, a carboxyl group, a sulfonic acid group, a phosphoric acid group, a phosphoester group, an ester group, a thioester group, an amido group, a nitro group, a monovalent hydrocarbon group, 15 an organooxy group, an organoamino group, an organosilyl group, an organothio group, an acyl group or a sulfone group, two sulfur atoms contained in the dithiin ring may independently be in the form of an  $\text{SO}$  group or an  $\text{SO}_2$  group, and  $q$  is 0 or an integer of 1 or over provided that  $p + q + r$  20  $\leq 20$  is satisfied.